ANALYSIS OF THE PRECIPITATION OF RAINS AND SNOWS AT MOUNT VERNON, IOWA

By LYLE L. COTTRAL

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Under the direction of Dr. Nicholas Knight, Cornell College, Mount Vernon, Iowa, has for the last 20 years carried on an analysis of the rain and snow precipitated here. The results of much of this work have been pub-

lished in periodicals of a scientific nature.

The precipitations are collected in clean granite pans, away from trees and buildings, and stored in glass stoppered bottles. The town has no factories and, exclusive of the college, has a population of about 1,700. The sulphuric acid found comes therefore mainly from the coal used in private heating plants. It has been found necessary to deduct 3.55 parts per million from the reading to allow for the formation of the color in the test for the chlorides. The precipitations come from the east or the south, which signify that the salt is carried by the winds from the Atlantic Ocean or the Gulf of Mexico. Due to some criticism special care has been taken in the analysis of the chlorides, which, after considerable work, we have reason to believe correct. The phenoldisulphonic acid method was used with the nitrates. All of the samples were colorless.

The methods used in the analysis are taken from the Standard Methods of Water Analysis, sixth edition, published by the American Health Association.

TABLE 1

No. of sam- ple	Date of precipi- tation, 1930	Amount	Rain or snow	Nitrates	Nitrites	Free ammo- nia	Albumi- noid ammo- nia	Sul- fates	Chlo- rides
1 2 3 4 5	May 5 May 6 June 5 June 13 June 14	0. 6 0. 25 1. 5 0. 25 0. 35	Raindododododododododo	0. 04 0. 06 0. 06 0. 32 0. 64	0.0001 Traces. Traces. Traces. Traces.	0.056 0.04 Traces. Traces. Traces.	Traces. Traces. Traces.		14. 2 7. 1 15. 62 21. 30
6 7 8 9 10	June 15 June 25 June 30 Sept. 25 Sept. 26	3. 0. 2 0. 45 0. 25 2. 0	do do do do	0. 64 0. 32 0. 64 0. 64 0. 64	Traces. 0.0002 0.0004 Traces. Traces.	Traces. Traces. 0.054 0.08 0.08	Traces. Traces. Traces.		14. 2 24. 85 28. 40 38. 50
11 12 18 14 15	Oct. 6 Oct. 7 Oct. 16 Oct. 29 Oct. 30	0. 25 1. 90 0. 75 0. 20 0. 20	do do do	1. 28 0. 64	0. 004 0. 0001 0. 001 Traces. 0. 0002	Traces. 0.064 0.072. 0.0752	0. 931 0. 0416	0. 012	31. 95 31. 95 31. 95 17. 75
16 17 18 19 20	Nov. 15 Nov. 16 Nov. 20 Nov. 25 Nov. 30	0. 25 1. 00 0. 4 4. 0. 6	dododo do Snow Rain	0. 64 0. 64 1. 28 0. 32 0. 64	0. 0017 0. 0001 0. 001 Traces. 0. 0008	0. 08 Traces, 0. 200 0. 078 0. 0288	0. 120 Traces. Traces. 0. 0496 0. 0160	0.044	
21 22 23 24 25	Dec. 5 Dec. 13 Dec. 18 Jan. 18 Feb. 6	0. 7 5. 00 4. 4. 3.	Snowdododo	0. 32 0. 64 0. 64 0. 64 0. 64	0. 001 Traces. 0. 0006 0. 0002 0. 001	0. 0272 0. 016 0. 0192 0. 064 0. 144	0.0048 0.0032	0. 024 0. 146 0. 428 0. 218	14. 2 17. 75 3. 55 10. 65
26 27 28 29 30	Mar. 7 Mar. 24 Mar. 27 Mar. 28 Apr. 3	4. 0. 3 4. 15. 0 0. 15	Rain Snow do Rain		0. 0004 0. 0004 0. 0004 Traces. 0. 0544	0. 72 0. 448 0. 04 0. 04 0. 800	0. 98 0. 64 0. 04	0. 184 0. 104 0. 068 1. 68 3. 4	3. 55 3. 55 3. 55 7. 10 7. 10
31 32 33 34 35	Apr. 9 Apr. 16 Apr. 19 Apr. 20 Apr. 21	0. 10 0. 4 0. 8 0. 5 0. 5	do do do do	0. 64 1. 28 0. 74 0. 64 0. 64	0. 0128 Traces. 0. 0001 Traces. 0. 0001	1. 60 0. 52 1. 200 0. 32	0. 640 0. 245 0. 160 0. 136	0. 30 1. 4 2. 00 1. 30 3. 60	10. 65 3. 55 3. 55 3. 55 3. 55
36 37 38 39 40	May 9 May 11	0. 5 0. 4 0. 4	do do do	0. 64 1. 28 0. 65 1. 28 0. 32	0. 001 0. 0002 0. 0004 0. 0007 Traces.	0. 89 0. 544 0. 36 0. 64 0. 04	Traces.	2, 00 2, 00 3, 70	7. 10 3. 55 3. 55 7. 10 7. 10
41 42 43	June 5 June 6 June 7		do do	0. 64 0. 64 0. 64	0. 016 0. 0001 0. 0002	0. 08 0. 98	Traces. Traces.		10. 65 3. 55 3. 55

12 inches of snow=1 inch of rain.

The results of the school year 1930-31 are expressed in Tables 1 and 2. The numbers indicate the parts of the various substances in a million parts of water.

TABLE 2.—Data from Table 1 converted to pounds per acre
[1 inch of rain over 1 acre=226,875 pounds]

3 20, 418 Traces. Traces. Traces. 05, 304 4 18, 150 Traces. Traces. Traces. 00, 244 01, 20771 5 50, 819 Traces. Traces. 00, 244 01, 20771 6 43, 522 Traces. Traces. 00, 244 00, 656 7 01, 452 00, 9075 Traces. 01, 20, 20 00, 656 9 03, 630 Traces. 04, 536 Traces. 02, 904 10 29, 040 Traces. 04, 536 Traces. 02, 904 11 18, 150 22, 680 — 01, 70 10, 88 15, 827 0, 0204 05, 44 12 27, 588 00, 431 Traces. 15, 827 0, 0204 05, 44 12 27, 588 00, 431 Traces. 15, 827 0, 0204 05, 44 12 20, 904 Traces. 01, 968 16, 00, 00, 00, 00, 00, 00, 00, 00, 00, 0							
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INTERPOLATION OF RAINFALL BY THE METHOD OF CORRELATION 1

By C. E. GRUNSKY

It was in 1885 that it fell to me, as assistant State engineer, to prepare a rainfall map of this State. Records were available at 200 or more stations. It was found that at a large number of these stations observations had commenced in 1871 and that for this group of stations the records, covering 14 years and kept under the supervision of railroad employees, were fairly good. There were only a few widely scattered places in the State at which rainfall records extended back over more than 30 years. It was, therefore, determined to ascertain from each available record the average annual rainfall for this 14-year period and to let the isohyetal lines on the map represent the average rainfall at any point for this period.

¹ The article by Eric R. Miller under the above title, published in this REVIEW, 59: 35, has elicited the account berewith of a method of interpolation followed many years ago in California by Mr. C. E. Grunsky, of C. E. Grunsky Co., engineers, 57 Post Street, San Francisco, Calif. Mr. Grunsky's letter is given above.—Ed.